CLAIMS

1. A method for treating autoimmune disease in a patient comprising the steps of T cell ablation and reactivation of the thymus.

2. The method of claim 1 wherein the patient's thymus has been at least in part deactivated.

3. The method of claim 2 wherein the patient is post-pubertal.

4. The method of claim 1 further comprising the step of administering hematopoietic stem cells to the patient.

5. The method of claim 4 wherein the hematopoietic stem cells are CD34+.

6. The method of claim 4 wherein the hematopoietic stem cells are autologous.

7. The method of claim 4 wherein the hematopoietic stem cells are not autologous.

8. The method of claim 4 wherein the hematopoietic stem cells are administered about the time when the thymus begins to regenerate or shortly thereafter.

9. The method of claim 4 wherein the hematopoietic stem cells are provided at the time disruption of sex steroid mediated signaling to the thymus is begun.

10. The method of claim 1 wherein the method of disrupting the sex steroid mediated signaling to the thymus is through surgical castration to remove the patient's gonads.

11. The method of claim 1 wherein the method of disrupting the sex steroid mediated signaling to the thymus is through administration of one or more pharmaceuticals.

12. The method of claim 11 wherein the pharmaceuticals are selected from the group consisting of LHRH agonists, LHRH antagonists, anti-LHRH vaccines and combinations thereof.

13. The method of claim 12 wherein the LHRH agonists are selected from the group consisting of Eulexin, Goserelin, Leuprolide, Dioxalan derivatives, Triptorelin, Meterelin, Buserelin, Histrelin, Nafarelin, Lutrelin, Leuprorelin and Deslorelin.

14. The method of claim 1 wherein the auto-immune disease is alleviated.

15. A method for treating an allergy in a patient comprising the steps of T cell ablation and reactivation of the thymus.

16. The method of claim 15 wherein the patient's thymus has been at least in part deactivated.

17. The method of claim 15 wherein the patient is post-pubertal.

18. The method of claim 15 further comprising the step of administering hematopoietic stem cells to the patient.

19. The method of claim 18 wherein the hematopoietic stem cells are CD34+.

20. The method of claim 18 wherein the hematopoietic stem cells are autologous.

21. The method of claim 18 wherein the hematopoietic stem cells are not autologous.

22. The method of claim 18 wherein the hematopoietic stem cells are administered about the time when the thymus begins to regenerate or shortly thereafter.

23. The method of claim 18 wherein the hematopoietic stem cells are provided at the time disruption of sex steroid mediated signaling to the thymus is begun.

24. The method of claim 15 wherein the method of disrupting the sex steroid mediated signaling to the thymus is through surgical castration to remove the patient's gonads.

25. The method of claim 15 wherein the method of disrupting the sex steroid mediated signaling to the thymus is through administration of one or more pharmaceuticals.

26. The method of claim 25 wherein the pharmaceuticals are selected from the group consisting of LHRH agonists, LHRH antagonists, anti-LHRH vaccines and combinations thereof.

27. The method of claim 26 wherein the LHRH agonists are selected from the group consisting of Eulexin, Goserelin, Leuprolide, Dioxalan derivatives, Triptorelin, Meterelin, Buserelin, Histrelin, Nafarelin, Lutrelin, Leuprorelin and Deslorelin.

28. The method of claim 15 wherein the allergy is alleviated.

29. A method for treating autoimmune disease in a post-pubertal patient, comprising:

ablating T cells in the patient; and

reactivating the thymus of the patient,

wherein the patient has an improved prognosis for the autoimmune disease compared to an untreated patient suffering from an autoimmune disease.

30. The method of claim 29, wherein the thymus of the patient has been at least in part atrophied before it is reactivated.

31. The method of claim 29, wherein the thymus is reactivated by disruption of sex steroid-mediated signaling to the thymus.

32. The method of claim 29, further comprising administering cells to the patient, wherein the cells are stem cells, progenitor cells, or combinations thereof.

33. The method of claim 32, wherein the stem cells are selected from the group consisting of hematopoietic stem cells, epithelial stem cells, and combinations thereof.

34. The method of claim 32, wherein the progenitor cells are selected from the group consisting of lymphoid progenitor cells, myeloid progenitor cells, and combinations thereof.

35. The method of claim 33, wherein the progenitor cells are selected from the group consisting of lymphoid progenitor cells, myeloid progenitor cells, and combinations thereof.

36. The method of claim 33, wherein the cells are hematopoietic stem cells.

37. The method of claim 36, wherein the hematopoietic stem cells are CD34+.

38. The method of claim 36, wherein the hematopoietic stem cells are autologous.

39. The method of claim 36, wherein the hematopoietic stem cells are not autologous.

40. The method of claim 36, wherein the hematopoietic stem cells are administered when the thymus begins to reactivate.

41. The method of claim 31, further comprising administering cells to the patient, wherein the cells are stem cells, progenitor cells, or combinations thereof.

42. The method of claim 41, wherein the stem cells are selected from the group consisting of hematopoietic stem cells, epithelial stem cells, and combinations thereof.

43. The method of claim 41, wherein the progenitor cells are selected from the group consisting of lymphoid progenitor cells, myeloid progenitor cells, and combinations thereof.

44. The method of claim 42, wherein the progenitor cells are selected from the group consisting of lymphoid progenitor cells, myeloid progenitor cells, and combinations thereof.

45. The method of claim 42, wherein the cells are hematopoietic stem cells.

46. The method of claim 31, wherein the sex steroid-mediated signaling to the thymus is disrupted by surgical castration.

47. The method of claim 31, wherein the sex steroid-mediated signaling to the thymus is disrupted by chemical castration.

48. The method of claim 31, wherein the sex steroid-mediated signaling to the thymus is disrupted by administration of one or more pharmaceuticals.

49. The method of claim 48, wherein the one or more pharmaceuticals is selected from the group consisting of LHRH agonists, LHRH antagonists, anti-LHRH vaccines, anti-

androgens, anti-estrogens, SERMs, SARMs, SPRMs, ERDs, armotase inhibitors, anti-progestogens, and combinations thereof.

50. The method of claim 49, wherein the LHRH agonists are selected from the group consisting of Eulexin, Goserelin, Leuprolide, Dioxalan derivatives, Triptorelin, Meterelin, Buserelin, Histrelin, Nafarelin, Lutrelin, Leuprorelin, Deslorelin Cystorelin, Decapeptyl, Gonadorelin, and combinations thereof.

51. The method of claim 49, wherein the LHRH antagonists are selected from the group consisting of Abarelix, Cetrorelix, and combinations thereof.

52. The method of claim 29, wherein the autoimmune disease is alleviated.

53. A method for treating an allergy in a patient, comprising:

ablating T cells in the patient; and

reactivating a thymus of the patient,

wherein the treated patient has an improved prognosis compared to an untreated patient.

54. The method of claim 53, wherein the thymus of the patient has been at least in part atrophied before it is reactivated.

55. The method of claim 54, wherein the thymus is reactivated by disruption of sex steroid-mediated signaling to the thymus.

56. The method of claim 53, wherein the patient is post-pubertal.

57. The method of claim 53, further comprising administering cells to the patient, wherein the cells are stem cells, progenitor cells, or combinations thereof.

58. The method of claim 57, wherein the stem cells are selected from the group consisting of hematopoietic stem cells, epithelial stem cells, and combinations thereof.

59. The method of claim 57, wherein the progenitor cells are selected from the group consisting of lymphoid progenitor cells, myeloid progenitor cells, and combinations thereof.

60. The method of claim 58, wherein the progenitor cells are selected from the group consisting of lymphoid progenitor cells, myeloid progenitor cells, and combinations thereof.

61. The method of claim 58, wherein the cells are hematopoietic stem cells.

62. The method of claim 61, wherein the hematopoietic stem cells are CD34+.

63. The method of claim 61, wherein the hematopoietic stem cells are autologous.

64. The method of claim 61, wherein the hematopoietic stem cells are not autologous.

65. The method of claim 61, wherein the hematopoietic stem cells are administered when the thymus begins to reactivate.

66. The method of claim 55, further comprising administering cells to the patient, wherein the cells are stem cells, progenitor cells, or combinations thereof.

67. The method of claim 66, wherein the stem cells are selected from the group consisting of hematopoietic stem cells, epithelial stem cells, and combinations thereof.

68. The method of claim 66, wherein the progenitor cells are selected from the group consisting of lymphoid progenitor cells, myeloid progenitor cells, and combinations thereof.

69. The method of claim 67, wherein the progenitor cells are selected from the group consisting of lymphoid progenitor cells, myeloid progenitor cells, and combinations thereof.

70. The method of claim 67, wherein the cells are hematopoietic stem cells.

71. The method of claim 70, wherein the hematopoietic stem cells are administered when the thymus begins to reactivate.

72. The method of claim 70, wherein the hematopoietic stem cells are administered at the time disruption of sex steroid-mediated signaling to the thymus is begun.

73. The method of claim 55, wherein the sex steroid-mediated signaling to the thymus is disrupted by surgical castration.

74. The method of claim 55, wherein the sex steroid-mediated signaling to the thymus is disrupted by chemical castration.

75. The method of claim 55, wherein the sex steroid-mediated signaling to the thymus is disrupted by administration of one or more pharmaceuticals.

76. The method of claim 75, wherein the one or more pharmaceuticals is selected from the group consisting of LHRH agonists, LHRH antagonists, anti-LHRH vaccines, anti-androgens, anti-estrogens, SERMs, SARMs, SPRMs, ERDs, armotase inhibitors, anti-progestogens, and combinations thereof.

77. The method of claim 76, wherein the LHRH agonists are selected from the group consisting of Eulexin, Goserelin, Leuprolide, Dioxalan derivatives, Triptorelin, Meterelin, Buserelin, Histrelin, Nafarelin, Lutrelin, Leuprorelin, Deslorelin, Cystorelin, Decapeptyl, Gonadorelin, and combinations thereof.

78. The method of claim 76, wherein the LHRH antagonists are selected from the group consisting of Abarelix, Cetrorelix, and combinations thereof.

79. The method of claim 53, wherein the allergy is alleviated.

80. The method of claim 29, further comprising administering at least one cytokine, at least one growth factor, or a combination of at least one cytokine and at least one growth factor to the patient.

81. The method of claim 80, wherein the cytokine is selected from the group consisting of Interleukin 2 (IL-2), Interleukin 7 (IL-7), Interleukin 15 (IL-15), and combinations thereof.

82. The method of claim 80, wherein the growth factor is selected from the group consisting of members of the epithelial growth factor family, members of the fibroblast growth factor family, stem cell factor, granulocyte colony stimulating factor (G-CSF), keratinocyte growth factor (KGF), and combinations thereof.

83. The method of claim 81, wherein the growth factor is selected from the group consisting of members of the epithelial growth factor family, members of the fibroblast growth factor family, stem cell factor, granulocyte colony stimulating factor (G-CSF), keratinocyte growth factor (KGF), and combinations thereof.

84. The method of claim 53, further comprising administering at least one cytokine, at least one growth factor, or a combination of at least one cytokine and at least one growth factor to the patient.

85. The method of claim 84, wherein the cytokine is selected from the group consisting of Interleukin 2 (IL-2), Interleukin 7 (IL-7), Interleukin 15 (IL-15), and combinations thereof.

86. The method of claim 84, wherein the growth factor is selected from the group consisting of members of the epithelial growth factor family, members of the fibroblast growth factor family, stem cell factor, granulocyte colony stimulating factor (G-CSF), keratinocyte growth factor (KGF), and combinations thereof.

87. The method of claim 85, wherein the growth factor is selected from the group consisting of members of the epithelial growth factor family, members of the fibroblast growth factor family, stem cell factor, granulocyte colony stimulating factor (G-CSF), keratinocyte growth factor (KGF), and combinations thereof.

88. A method for delivering a sex steroid analog to a patient, comprising:

laser-irradiating the skin of the patient to create perforations or alterations in the skin, and

placing the sex steroid analog on the irradiated skin,

wherein the sex steroid analog is delivered through the perforations or alterations in the irradiated skin.

89 . A method for delivering a sex steroid analog to a patient, comprising:

delivering the sex steroid analog to the skin of the patient, and

permeabilizing the skin of the patient with high pressure impulse transients,

wherein the impulse transients cause the sex steroid analog to diffuse through the permeabilized skin of the patient.

90. A method for enhancing transplantation of donor hematopoietic stem cells into the thymus of a recipient patient, comprising:

depleting the T cells of the patient,

reactivating the thymus of the patient, and

transplanting donor hematopoietic stem cells to the patient,

wherein uptake of the donor hematopoietic stem cells into the patient's thymus is enhanced as compared to the uptake that would have otherwise occurred in a patient prior to thymus reactivation.

91. A method for increasing virus-specific peripheral T cell responsiveness of a patient with an at least partially atrophied thymus, comprising:

reactivating the thymus of the patient,

exposing the patient to a virus,

determining the virus-specific peripheral T cell responsiveness in the patient,

wherein the patient has an increased viral-specific peripheral T cell responsiveness as compared to the responsiveness that would have otherwise occurred in a patient prior to thymus reactivation.